IMPROVING THE PEDAGOGICAL MECHANISMS FOR DEVELOPING STUDENTS' VISUAL-COGNITIVE ACTIVITY IN VISUAL ARTS CLASSES

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Abstract. The article examines the pedagogical mechanisms that develop students' visual-cognitive activity in visual arts classes and proposes ways of improving them. Visual-cognitive activity is understood as purposeful mental work with visual information: perceiving, analyzing, interpreting, and transforming images in order to create new ones. On the basis of a review of the psychological and pedagogical literature, five mechanisms are substantiated: guided observation, problem situations, dialogue and questioning, dual coding of ideas through sketch and word, and reflection with formative feedback. A five-stage lesson structure, a set of tasks, and a four-level scheme for assessing students' progress are described. The study is conceptual and methodological, and its conclusions require further experimental verification.

Keywords: visual-cognitive activity; visual arts education; visual thinking; pedagogical mechanisms; dialogue; reflection; assessment.

Introduction

Children today live in a dense visual environment of screens, advertisements, photographs, and short videos. They see more images than any previous generation, but seeing a great number of images does not mean understanding them. Teachers of visual arts regularly observe that students look at an object quickly, record only its general outline, and then reproduce a stereotype instead of the actual form in front of them. The task of the school is therefore not only to teach technique but also to develop the ability to look attentively, to think with images, and to explain what has been seen and made.

In pedagogical research this ability is often described as visual thinking. Arnheim argued that perception itself is a cognitive activity and that seeing involves selecting, comparing, and organizing, not passive recording [1]. If this is so, then a lesson of visual arts is a natural place for the development of cognition, and not an "additional" subject that only trains the hand. Nevertheless, in practice the lesson is often built as a sequence of imitative operations: the teacher demonstrates, the students copy. Such a structure leaves little room for independent cognitive effort.

The aim of this article is to clarify the essence of visual-cognitive activity and to describe pedagogical mechanisms that improve its development in school visual arts classes. The tasks are the following: to define the concept and its structure; to identify typical difficulties of current practice; to propose a system of mechanisms and a lesson structure; and to outline criteria for assessing the results. The article is not a report on an experiment; it is a methodological study based on theoretical analysis.

1. The essence and structure of visual-cognitive activity

In this article visual-cognitive activity is defined as purposeful mental and practical work with visual information, in which the student perceives an object or an image, analyzes its properties, interprets its meaning, and uses the results to create his or her own visual product. The definition stresses two points. First, the activity is cognitive, since it leads to new knowledge and understanding and not only to a picture. Second, it is visual, since the main carrier of information is the image and not the verbal description.

Four components can be distinguished in its structure. The perceptual component covers attention, the discrimination of form, colour, tone, and space, and the ability to notice details. The analytical component is the ability to compare, to find structure, and to separate the essential from the secondary. The interpretive component concerns meaning: what the image expresses, what the author might have intended, and how it relates to culture and personal experience. The productive component is the transformation of this understanding into a sketch, a composition, or a design [3]. These components are not consecutive stages in a strict sense; in real work they interact and return to one another.

Several theoretical sources support this understanding. Gardner's theory of multiple intelligences draws attention to spatial intelligence as an independent form of ability [4]. Paivio's dual coding theory explains why information that is encoded both visually and verbally is remembered and used better [5]. Vygotsky's idea that higher mental functions develop through mediated activity and social interaction justifies the importance of dialogue in the lesson [6]. Finally, Eisner emphasized that work in the arts teaches students to perceive relationships and to make judgments in the absence of fixed rules [7].

2. Typical difficulties in current practice

Analysis of the literature and of widespread teaching practice makes it possible to identify several recurring difficulties. The first is the dominance of the imitative model. When the final result is a copy of the teacher's sample, the student has no need to analyze or to decide, and the cognitive component of the activity remains undeveloped. The second is the separation of looking and making. Students look at a reproduction for a few minutes and then begin to work, but nobody asks them what exactly they noticed or how it influenced their decisions.

The third difficulty is the weakness of verbal mediation. Students often feel that they understand a picture but cannot say why, so their observations remain at the level of "I like it" or "it is beautiful". Research on the development of aesthetic understanding shows that, with appropriate guidance, students move from such simple statements to reasoned interpretation, but this does not happen spontaneously [8]. The fourth difficulty is formal assessment, which evaluates neatness and similarity to a model and leaves out the quality of thinking. The fifth is cognitive overload: when too many new tasks are given at once, students cannot concentrate on the key relationships [9].

3. A system of pedagogical mechanisms

4. To overcome these difficulties, we propose a system of five interrelated mechanisms (Figure 1). A mechanism is understood here as a stable way of organizing the interaction of the teacher and students that reliably produces a certain developmental effect. The mechanisms are intended to be used together in every lesson, in different proportions.

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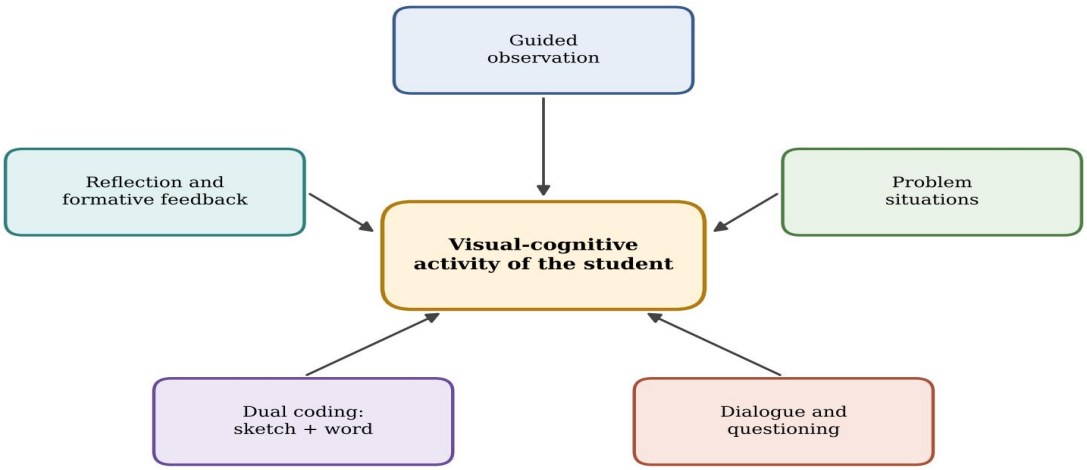


Figure 1. Pedagogical mechanisms for developing visual-cognitive activity (author's model).

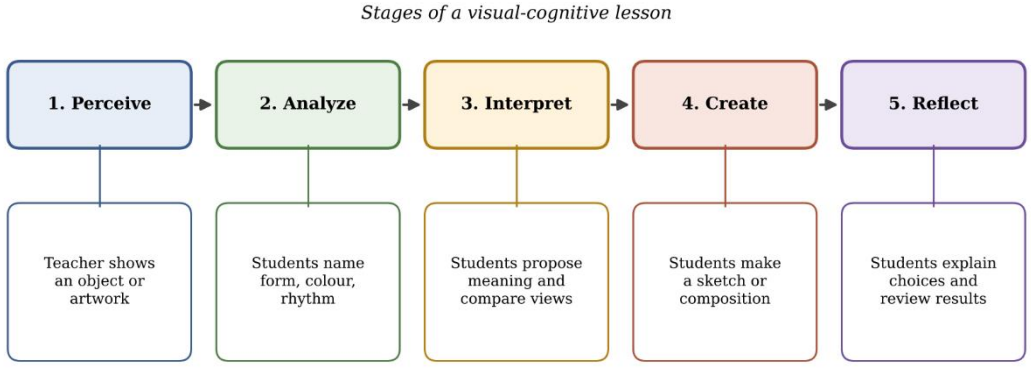
Guided observation. The teacher organizes looking as a task with a purpose, for example "find three different kinds of edges in this still life" or "follow the path of the eye through this painting". Observation is separated from drawing, so that the student first collects visual information and only then uses it. Short timed exercises, drawing from memory after careful looking, and comparison of two similar objects are effective forms of such work [2].

Problem situations. Instead of a model to be copied, the student receives a problem that has several possible solutions, for instance, to show the feeling of a windy day using only line and two colours. A problem situation creates a gap between what the student knows and what is required, and this gap motivates search. The teacher's task is to select problems that lie within the zone of proximal development: not so easy that no thinking is needed, and not so difficult that the student gives up.

Dialogue and questioning. The teacher uses open questions that cannot be answered by a single word. The well-known approach of visual thinking strategies, based on three questions about what is going on in an image, what the student sees that supports this view, and what else can be found, shows that regular group discussion of artworks improves the ability to observe and to support an opinion with evidence [10]. The teacher paraphrases students' statements, connects them, and does not announce the "correct" interpretation.

Dual coding of ideas. Students are asked to express each idea in two forms: a quick sketch and a short verbal comment. A sketch of a composition in three minutes, with a sentence about its main contrast, makes thinking visible and helps the teacher to understand the logic of a student's decisions.

Reflection and formative feedback. At the end of the task students analyze their own and their peers' works using simple criteria. Feedback from the teacher is directed at the task and the process, and says what has been achieved and how to move further, not simply how many points have been



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earned.

4. **Lesson structure and tasks**

5. The mechanisms are realized in a lesson of five stages (Figure 2). The structure is flexible: in a short lesson two stages may be combined, and in a project-based unit each stage may occupy a separate session.

6. Figure 2. A five-stage structure of a lesson aimed at developing visual-cognitive activity.

At the stage of perception the teacher presents an object, a reproduction, or a natural motif and sets a focused observation task. At the stage of analysis students name the visual properties they have noticed and compare them. At the stage of interpretation they propose what the image expresses and listen to alternative views. At the stage of creation they make their own sketch or composition and use what was discovered earlier. At the stage of reflection they explain their decisions and evaluate the result. The proportion of the stages is changed according to the age of the students, so that younger children spend more time on direct sensory exploration, and older students on interpretation and argumentation.

Table 1 shows examples of tasks that correspond to the mechanisms. The examples are deliberately simple, because their value lies in the organization of thinking and not in the complexity of the subject matter. Table 1. Examples of tasks for the pedagogical mechanisms

Mechanism	**Example of a task**	**Cognitive result**
Guided observation	Look at a still life for two minutes, then list five tones of one colour	Finer discrimination of tone and colour
Problem situation	Show “silence” and “noise” in two small compositions using only geometric shapes	Search for expressive means
Dialogue and questioning	Discuss a painting by three questions: what is happening, what shows it, what else can we find	Interpretation supported by evidence
Dual coding	Make a three-minute thumbnail sketch and write one sentence on its main contrast	Link between image and concept
Reflection and feedback	Pairs exchange works and name one successful and one unclear decision	Self-assessment and critical thinking

5. Assessment of students' progress

If lessons aim at thinking, assessment must also take thinking into account. We propose to evaluate not only the finished work but also the process: the quality of observation, the variety of solutions considered, the ability to explain choices, and the use of feedback. Formative assessment during the lesson, supported by simple rubrics, helps students to understand what is expected and how to improve. Table 2 describes four levels of visual-cognitive activity that can be used as a general orientation.

Table 2. Levels of students' visual-cognitive activity

Level	Characteristics	Typical student action
Reproductive	Looks briefly, relies on stereotypes, copies a model	Draws what he or she "knows", not what is seen
Descriptive	Notices and names visible properties of an object	Lists colours, shapes, and details
Analytical	Finds relationships, compares, explains structure	Explains why a composition is balanced
Creative-interpretive	Interprets meaning and uses findings in an original work	Proposes and defends a personal solution

The levels should not be used as labels for children. They describe the quality of a particular activity in a particular task, and the same student can work at different levels in different situations. The teacher's purpose is to create conditions in which the share of analytical and creative-interpretive work gradually increases.

6. An illustrative lesson fragment

To show how the mechanisms operate together, consider a hypothetical lesson for the sixth grade on the theme "Autumn tree: structure and mood". The lesson lasts forty minutes and follows the five stages of Figure 2.

At the perception stage the teacher shows a real branch and asks the students to look at it for two minutes with one task: to find where the branch divides and in what direction each part grows. Nobody draws yet. At the analysis stage the students name what they have noticed, for example that thicker parts are darker, that new shoots grow upward, and that the angles of division are rarely equal. The teacher writes these observations on the board using the students' own words and then asks which of them would be most useful for a drawing.

At the interpretation stage the class looks at two reproductions of autumn landscapes by different painters and answers the open questions: what mood does each picture have, and what shows this? The students notice that one painter uses warm light colours and soft edges, while the other uses cold dark tones and sharp lines. The teacher does not choose a "better" picture but asks how the same season can be shown in two different ways. At the creation stage each student makes a thumbnail sketch of the branch in the mood of his or her choice, writes one sentence about the main contrast, and then develops the sketch into a larger work.

At the reflection stage students work in pairs: each names one decision in the partner's work that expresses the chosen mood and one place where the idea is not yet clear. The teacher's feedback concerns the process and says, for instance, that the student has used the observation about the angles of division very effectively and that the next step is to vary the thickness of line. The example shows that the cognitive load is distributed over several short tasks, that every task has a visible product, and that the student constantly returns from the image to the word and back.

7. Conditions for the effective use of the mechanisms

Several conditions determine whether the mechanisms will work. The first is the teacher's readiness to change his or her role from a source of ready answers to an organizer of thinking; this requires training in questioning and in giving feedback. The second is a sufficient amount of time. A lesson overloaded with technical operations leaves no room for discussion, so it is better to reduce the number of tasks than to give up reflection. The third is a safe atmosphere, in which an unusual idea or a mistaken observation is treated as material for discussion and not as a failure. The fourth is the gradual increase of complexity, which protects students from cognitive overload.

Digital resources can support the mechanisms, provided that they serve the thinking and do not replace it. High-quality reproductions on a screen allow the class to enlarge details, and a simple application for sketching helps to make quick studies. At the same time, the multimedia principles show that excessive decoration and simultaneous sources of information reduce understanding, so slides should be concise and purposeful.

The study shows that the development of visual-cognitive activity in visual arts classes depends on the way in which the interaction of the teacher and students is organized. The proposed system of five mechanisms, the five-stage lesson structure, and the four-level assessment scheme make it possible to turn the lesson from imitation into purposeful cognitive work with images. The approach is consistent with the main ideas of cognitive psychology and with the practice of art education, and it can be adapted to different ages and to different content. The limitations of the study are clear. The system has been justified theoretically and has not yet been verified in a controlled experiment. Further work should include experimental teaching with comparison groups, the development of diagnostic tasks for each component of visual-cognitive activity, and the adaptation of the mechanisms to the requirements of the national curriculum.

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